

# The Royal Melbourne Hospital's Acute Stroke Unit

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Melbourne is located within the state of Victoria, a southern state of Australia, and has a population of 5.3 million people. The Royal Melbourne Hospital (RMH) is centrally located in the Parkville Biomedical Precinct just north of the Melbourne central business district. The RMH stroke unit services the north-west suburbs of Melbourne and wider Victoria. The stroke unit was established in 1995, making it one of the longest established stroke services in Australia.<sup>1</sup> The stroke unit is one of two designated state-wide endovascular clot retrieval (ECR) centers providing 24-hour, seven day a week access to specialized stroke treatment including ECR and neurosurgery.

The RMH was certified as a Comprehensive Stroke Center (CSC) in 2024 by the Australian Stroke Coalition (Stroke Foundation and Australian and New Zealand Stroke Organisation joint body) and co-badged with the World Stroke Organisation. Seeking stroke unit certification in Australian hospitals is currently voluntary; however, stroke unit certification is recommended by the World Health Organization, the World Stroke Organisation and the Australian Government's National Strategic Action Plan for Heart Disease and Stroke. To date, 19 hospitals have achieved certification under this new process.<sup>2</sup>

The CSC is staffed by a multidisciplinary team comprised of stroke neurologists, stroke fellows, advanced trainees in neurology (senior residents), basic physician trainees (junior residents),

interns, a stroke nurse practitioner, stroke nurse consultants, nurse educators, stroke research nurses, ward nurses, physiotherapists, occupational therapists, speech pathologists, dietitians, social workers, music therapists, allied health assistants and neuro psychologists. Further, the unit has the support of neurosurgeons, vascular surgeons, rehabilitation physicians, geriatricians, palliative care physicians and neuro-interventionists.

The CSC is an internationally recognized tertiary academic unit that provides expert care across the stroke continuum and admits over 1,150 patients with stroke and transient ischemic attack (TIA) per year. With a strong focus on research, patients can be involved in hyperacute and acute trials through the Melbourne Brain Centre's Stroke Research Group. The practice-changing EXTEND,<sup>3</sup> EXTEND-IA,<sup>4</sup> EXTEND-IA TNK<sup>5 6</sup> series of trials were led by the RMH team.

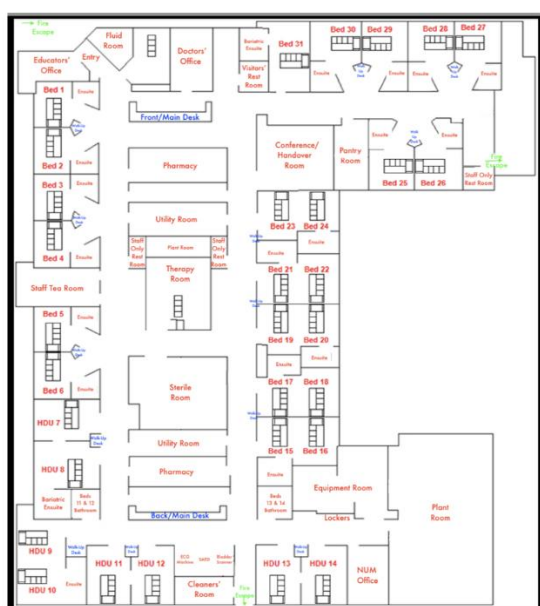
The 31 bed Stroke and Neurology Unit has a patient-centered design. The unit includes abundant natural light, and cozy nooks where staff, patients and visitors can interact, and clinicians can observe incidental rehab activities or write up their clinical notes. The effect is a calming environment, which supports physical activity and social connectedness. Patient rooms are located around the outside of the



## In Our Stroke Unit

unit to capture natural light. Previously decentralized rehabilitation services are accommodated in a central rehabilitation gym within the ward that facilitates specialty allied health group sessions in addition to one-on-one rehabilitation. Specialty allied health groups are held in the central hub including aphasia group introduced by the speech pathology team and upper limb therapy group managed by the occupational therapists.

Ward 8B – Stroke and Neurology



The stroke unit has small staff workbenches outside a pair of patient rooms to enable constant oversight and frequent interaction. Glazed walls and windows in the high-dependency unit rooms can be switched from clear to opaque when privacy is required. The high acuity area has telemetry monitoring for hyperacute patients on arrival to the CSC and all rooms have overhead tracking to accommodate the hoist system utilized on the ward.



The RMH was the first Australian hospital to introduce the stroke nurse practitioner role in 2010. The role works closely with the stroke nurse consultants to provide advanced nursing practice for the stroke population. The stroke nurse practitioner is an experienced, academically-prepared, and board-endorsed nurse who facilitates stroke care across patients' hospital journeys, from the hyperacute phase, throughout the inpatient stay, to outpatient follow-up. The role improves continuity of care, as well as risk factor modification and secondary stroke prevention for patients suspected of, or diagnosed with, TIA or stroke. The advanced academic and clinical preparation allows for extended nursing practice that includes prescribing, diagnostic ordering, and interpretation to help meet stroke patient's and caregiver's needs. The role integrates research, education, clinical practice, management and leadership.<sup>7</sup>

Continuity of care is ensured in the outpatient setting with stroke, cerebrovascular and rapid access TIA clinics. The TIA rapid access clinic (TIARA) is a weekly clinic, currently managed by a telehealth model. The clinic runs two templates staffed by a stroke neurologist and stroke nurse practitioner, each reviewing 6 patients weekly. The model allows TIA patients early discharge from the emergency department (ED) following brain imaging (computed tomography [CT], CT angiography), 12-lead electrocardiogram, and initiation of secondary prevention medications. Outpatient magnetic resonance imaging and cardioembolic workup with transthoracic echocardiogram, and Holter monitoring are arranged on discharge from the ED by the stroke team. TIA patients in the TIARA clinic are seen within 2-3 weeks of discharge on completion of the outpatient workup.



## In Our Stroke Unit

With the introduction of the Electronic medical record (EMR) in 2020 at RMH, the RMH stroke team created stroke order sets for ischemic and hemorrhagic stroke to guide clinical practice. A Stroke Registry has been maintained by the stroke nurse practitioner and stroke nurse consultants since the early 2000's. A quality improvement project to build a stroke navigator program within the hospital's electronic medical record was completed this year. The custom-built stroke navigator now captures the data collection requirements for internal reporting and ensures that the hospital can continue to contribute data to the Australian Stroke Clinical Registry (AuSCR) which is a collaborative national effort to monitor, promote and improve the quality of acute stroke care. The dataset includes key quality of care variables.<sup>8</sup> The RMH Stroke Registry in the electronic health record is a contact or encounter based registry which includes patients managed under our stroke bed card at any time during the encounter or if there has been a Code Stroke documented in the stroke navigator program. This ensures that data is captured for all patients managed by the stroke team or referred to the stroke team with a code stroke call. The navigator has been designed to guide the team to ensure that evidence-based quality-of-care standards are met.

The Speech Pathology team have created an online 'Communication Training' course for all RMH CSC staff working with patients with communication impairments. This was created as part of an update to the Australian and New Zealand Living Guidelines for Stroke and given a strong recommendation that communication partner training should be provided to health professionals or volunteers who interact with people with aphasia after stroke.<sup>9</sup>

The Australian and New Zealand Living Guidelines for Stroke management strongly recommend that people diagnosed with acute stroke should have their swallowing screened by a trained health professional using a validated tool.<sup>9</sup> RMH nursing staff in the ED as well as in the CSC have been credentialled to conduct swallow screening. The Acute Swallow Screen in Stroke / TIA is the swallow screen used at the RMH, first introduced in 2006. It is a standardized, evidence-based tool that was endorsed by the Victorian Stroke Clinical Network during the development of the Victorian Dysphagia Screening Model (VDSM) in 2013.<sup>10</sup>

Patients and carers are actively included in all aspects of care. Regular meetings with patients and families or carers occur, carer training, and processes for providing discharge planning information are a part of routine management. The stroke nurse practitioner or stroke nurse consultant



provide all patients with the My Stroke Journey Pack prior to discharge, a written booklet designed by the Stroke Foundation that is tailored specifically to the patient.

In an Australian first, the Melbourne Mobile Stroke Unit (MSU) is based at the RMH. The MSU is a CT-equipped stroke treatment ambulance that offers stroke treatment and triage in the prehospital setting. The service works in collaboration

## In Our Stroke Unit

with the ED and Radiology teams to provide rapid access multimodal CT imaging, thrombolysis and thrombectomy.<sup>11</sup> The MSU is staffed by a RMH stroke consultant or fellow, stroke nurse practitioner or stroke nurse consultant, radiographer and two Ambulance Victoria paramedics. The vehicle is based at RMH and is automatically dispatched to patients with suspected stroke within a 20 km radius and by paramedic requests for service across Melbourne. The service runs Monday-Friday 8AM-6PM. The MSU delivers patients to the nearest appropriate stroke unit, with the majority destined for RMH due to the operating radius and the thrombectomy capabilities of our hospital.<sup>11</sup>

Advances in acute stroke management have dramatically transformed how patients are diagnosed, treated and managed over the past 25 years, and the RMH stroke unit has been led by some of the world's greatest vascular neurologists, namely Professors Stephen Davis (previous Head of Unit) and Bruce Campbell (current Head of Unit). The quality of care continues to improve each year thanks to the dedication of our multidisciplinary stroke team who provide superb evidence-based care for vulnerable stroke patients.

### Author Affiliation

Louise Weir is the Stroke Nurse Practitioner for the Royal Melbourne Hospital's Acute Stroke Unit in Melbourne, Victoria, Australia. She was endorsed in 2010 as Australia's first Stroke Nurse Practitioner.

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## In Our Stroke Unit

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